1. In an isosceles triangle ABC, with $AB = AC$, the bisectors of $\angle B$ and $\angle C$ intersect each other at O. Join A to O. Show that : (*i*) $OB = OC$ (*ii*) OA bisect $\angle A$.
2. In ΔABC, AD is the perpendicular bisector of BC (see Fig. 5.111). Show that ΔABC is an isosceles triangle in which $AB = AC$.
3. ABC is an isosceles triangle in which altitudes BE and CF are drawn to equal sides AC and AB respectively (see Fig. 5.112). Show that these altitudes are equal.
4. ABC is a triangle in which altitudes BE and CF to sides AC and AB are equal (see Fig. 5.113) . Show that

   (*i*) $\Delta ABE \cong \Delta ACF$

   (*ii*) $AB = AC$, *i.e.*, ABC is an isosceles triangle.

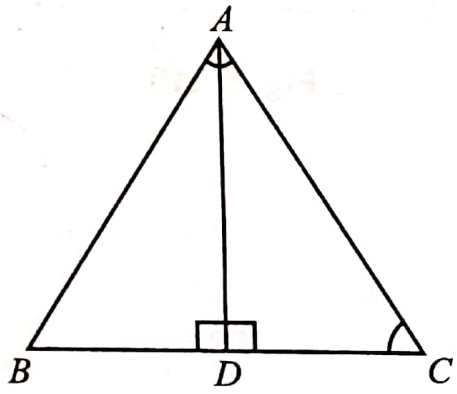

Fig. 5.111

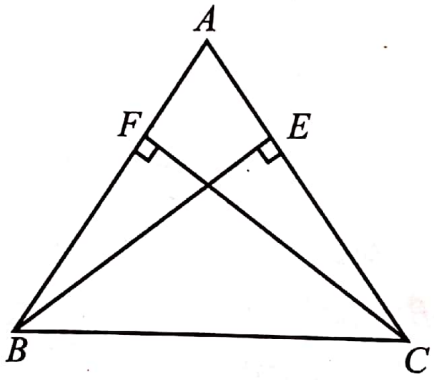

Fig. 5.112

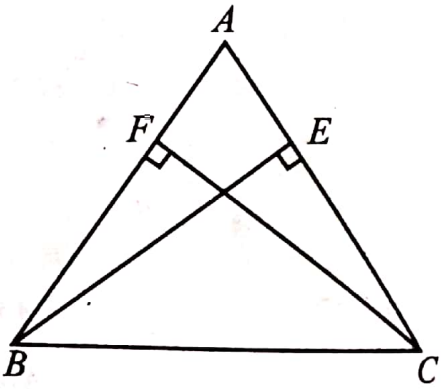

Fig. 5.113

5. ABC and DBC are two isosceles triangles on the same base BC (see Fig. 5.114). Show that $\angle ABD = \angle ACD$.
6. ΔABC is an isosceles triangle in which $AB = AC$. Side BA is produced to D such that $AD = AB$ (see Fig. 5.115). Show that $\angle BCD$ is a right angle.

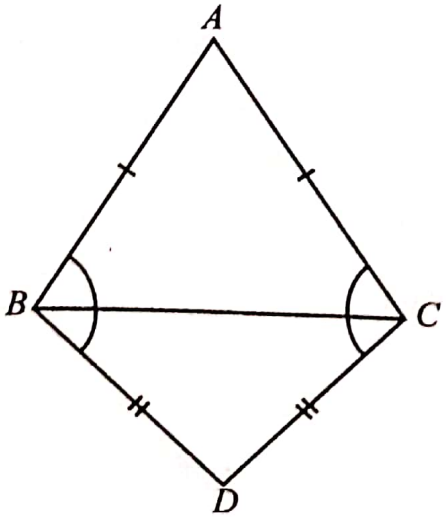

Fig. 5.114

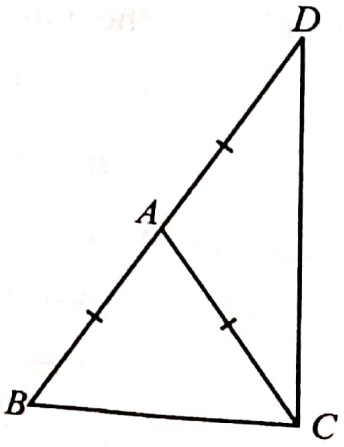

Fig. 5.115

MULTIPLE CHOICE QUESTIONS

1. Which of the following is not a congruence rule for two triangles?

   (*a*) *SAS* (*b*) *SSA* (*c*) *RHS* (*d*) *SSS*

2. It is given that $\Delta ABC \cong \Delta FDE$, $AB = 5$cm, $\angle B = 40°$ and $\angle A = 80°$, which of the following is true?

   (*a*) $DF = 5$ cm, $\angle F = 60°$ (*b*) $DC = 5$ cm, $\angle E = 60°$

   (*c*) $DE = 5$ cm, $\angle E = 60°$ (*d*) $DE = 5$ cm, $\angle D = 40°$

3. In ΔABC and ΔDEF, $\angle A = \angle D$, $\angle B = \angle E$ and $AB = DE$, then are the two triangles congruent? If yes, by which congruency criterion?

   (*a*) Yes, by AAS (*b*) NO (*c*) Yes, by ASA (*d*) Yes, by RHS

4. In ΔPQR, $\angle R = \angle P$, $QR = 4$ cm and $PR = 5$ cm. Then the length of PQ is

   (*a*) 4 cm (*b*) 5 cm (*c*) 2 cm (*d*) 2.5 cm

5. If $AB = QR$, $BC = RP$ and $CA = PQ$, then

   (*a*) $\Delta PQR \cong \Delta BCA$ (*b*) $\Delta BAC \cong \Delta RPQ$ (*c*) $\Delta CBA \cong \Delta PRQ$ (*d*) $\Delta ABC \cong \Delta PQR$

6. In ΔABC, $AB = AC$ and $\angle B = 50°$. The $\angle C$ is equal to

   (*a*) 50° (*b*) 40° (*c*) 130° (*d*) 80°

7. In ΔABC, $BC = AB$ and $\angle B = 80°$. Then $\angle A$ is equal to

   (*a*) 50° (*b*) 100° (*c*) 80° (*d*) 40°

8. D is a point on the side BC of a ΔABC such that AD bisects $\angle BAC$. Then

   (*a*) $BD = CD$ (*b*) $BA > BD$ (*c*) $BD > BA$ (*d*) $CD > CA$

9. Two sides of a triangle are of lengths 5 cm and 1.5 cm. The length of the third side of the triangle cannot be

   (*a*) 3.6 cm (*b*) 3.8 cm (*c*) 4.1 cm (*d*) 3.4 cm

10. In ΔPQR if $\angle R > \angle Q$, then

    (*a*) $QR > PR$ (*b*) $PQ > PR$ (*c*) $PQ < PR$ (*d*) $QR < PR$

11. In triangles ABC and DEF, $AB = FD$ and $\angle A = \angle D$. The two triangles will be congruent by *SAS* axiom if

    (*a*) $BC = EF$ (*b*) $AC = DE$ (*c*) $BC = DE$ (*d*) $AC = EF$

12. If $\Delta ABC \cong \Delta PQR$ and ΔABC is not congruent to ΔRPQ, then which of the following is not true:

    (*a*) $BC = PQ$ (*b*) $QR = BC$ (*c*) $AC = PR$ (*d*) $AB = PQ$

13. In triangles ABC and PQR, $AB = AC$, $\angle C = \angle P$ and $\angle B = \angle Q$. The two triangles are

    (*a*) isosceles but not congruent (*b*) isosceles and congruent

    (*c*) congruent but not isosceles (*d*) neither congruent nor isosceles